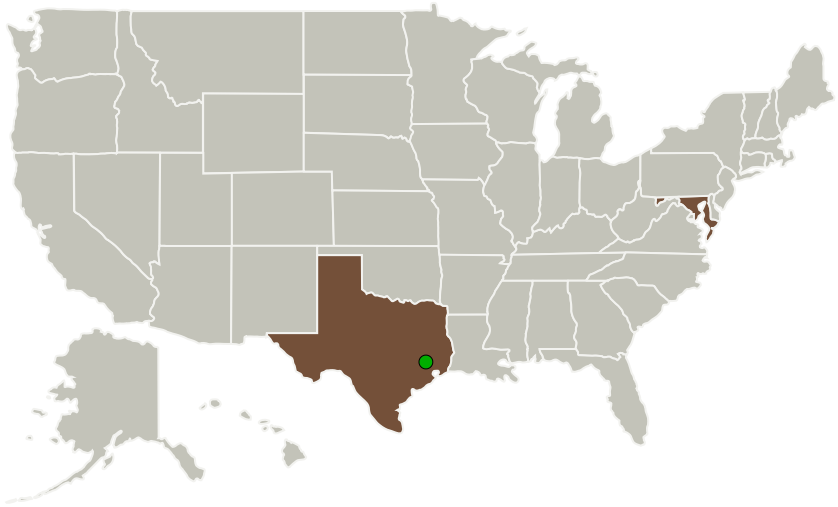
Passive Wireless Temperature Sensors with Enhanced Sensitivity and Range, Phase I

Completed Technology Project (2010 - 2010)

Project Introduction

This proposal describes the development of passive surface acoustic wave (SAW) temperature sensors with enhanced sensitivity and detection range for NASA application to remote wireless sensing of temperature distributions in composite overwrapped pressure vessels (COPVs) and development flight instrumentation (DFI) for test facilities for large area composite component validation testing. ASR&D has developed a novel SAW device structure that is more sensitive to temperature variations than previous SAW temperature sensor devices, that will function with the high S/N interrogation electronics being develop by ASR&D for longer range SAW sensor measurement. These demonstrated high sensitivity temperature sensors can be individually coded for identification, to operate in a multi-sensor system consisting of multiple passive solid-state SAW sensors that can be interrogated remotely using RF signals, and that respond with a signal that encodes both the sensor's identity as well as measurements of temperature. The proposed Phase I effort will modify the current temperature sensor devices to incorporate coding, build and test these sensors (wired), verify compatibility of the sensors with the wireless interrogation system electronics, and demonstrate wireless temperature sensing of multiple uniquely identifiable sensors.

Primary U.S. Work Locations and Key Partners



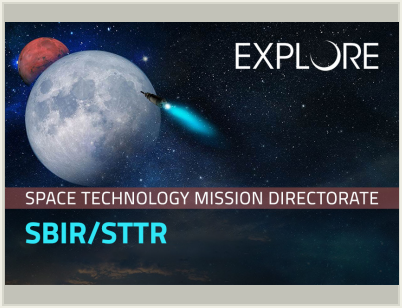


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Table of Contents

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Organizations Performing Work	Role	Type	Location
SenSanna Incorporated (formerly Applied Sensor Research & Development)	Lead Organization	Industry Women-Owned Small Business (WOSB), Veteran-Owned Small Business (VOSB)	Arnold, Maryland
Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Maryland	Texas

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140098)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

SenSanna Incorporated (formerly Applied Sensor Research & Development)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Leland P Solie

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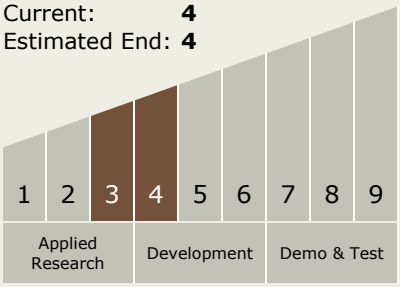
Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.6 Cryogenic / Thermal

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System